

AMENDMENTS TO THE CLAIMS

1. (Canceled).

2. (Canceled).

3. (Canceled).

4. (Canceled).

5. (Canceled).

6. (Canceled).

7. (Canceled).

8. (Canceled).

9. (Canceled).

10. (Canceled).

11. (Canceled).

12. (Canceled).

13. (Canceled).

14. (Canceled).

15. (Canceled).

16. (Currently amended). A bearing disposed as part of a mechanical device, said mechanical device including a solid part in frictional contact with said bearing such that there is relative movement between said solid part and said bearing when the mechanical device is being operated, wherein the bearing includes a bearing surface in relative movement with respect to said solid part, said bearing surface having enhanced wear and friction properties by contacting a monolithic part that has predominantly a metal carbide surface, at a portion of said metal carbide that forms said bearing surface, with a halogen-containing and hydrogen-containing gaseous etchant, having a hydrogen gas concentration of at least 0.3 ~~0.001 mole to 2 moles~~ of hydrogen for every two moles of halogen, and having a halogen gas concentration sufficient to remove metal from the metal carbide surface, at a temperature, pressure and for a time sufficient to provide essentially ~~[[only]] diamond or diamond and carbon nanocrystals~~ on the bearing surface of said metal carbide.

17. (Original) The bearing of claim 16, wherein the bearing surface is a ball bearing surface in the shape of a sphere.

18. (Original) The bearing of claim 16, wherein the bearing surface is pointed, forming an end of a needle bearing.

19. (Original) The bearing of claim 16, wherein the bearing surface is cylindrical, forming a roller bearing.

20. (Original) The bearing of claim 16, wherein the bearing surface forms the bearing surface of a thrust bearing.

21. (Original) The bearing of claim 16, wherein the bearing surface is annular and surrounds a rotating shaft to seal a volume between said rotating shaft and said bearing surface to prevent fluid from flowing between said bearing surface and said rotating shaft when said shaft rotates.

22. (Original) The bearing of claim 21, wherein the seal is disposed in contact with a shaft of a water pump.

23. (Original) The bearing of claim 21, wherein the seal is disposed in contact with the shaft of an oil pump.

24. (Canceled).

25. (Canceled).

26. (Canceled).

27. (Canceled).

28. (Canceled).

29. (Canceled).

30. (Canceled).

31. (Canceled).

32. (Canceled).

33. (Canceled).

34. (Canceled).

35. (Canceled).

36. (Canceled).

37. (Canceled).

38. (New) The bearing of claim 16, wherein the metal carbide comprising silicon carbide or titanium carbide.
39. (New) The bearing of claim 16, wherein the metal carbide contact temperature is at least about 100° C.
40. (New) The bearing of claim 39, wherein the metal carbide contact temperature is at least about 500° C.
41. (New) The bearing of claim 40, wherein the metal carbide contact temperature is in the range of about 500° C to about 1,100° C.
42. (New) The bearing of claim 41, wherein the reaction temperature is in the range of about 800° C to about 1,000° C and the contact time is in the range of about 10 minutes to about 62 hours.
43. (New) The bearing of claim 42, wherein the metal carbide contact time is in the range of about 0.5 hour to about 8 hours.
44. (New) The bearing of claim 38, wherein the metal carbide is silicon carbide.
45. (New) The bearing of claim 16, wherein the contact pressure is in the range of about 0 atmosphere to about two atmospheres.
46. (New) The bearing of claim 45, wherein the contact pressure is about one atmosphere.
47. (New) The bearing of claim 16, wherein the gaseous etchant gas comprises a mixture of a hydrogen gas and halogen-containing gas in a molar ratio of hydrogen gas to halogen-containing gas in the range of 0.50 mole of hydrogen per 2 moles of halogen.

48. (New) The bearing of claim 47, including contacting the metal carbide with a first gaseous etchant having a first concentration of halogen-containing gas and first concentration of H_2 , and thereafter contacting the metal carbide with a second gaseous etchant having a different concentration of both halogen-containing gas and H_2 .

49. (New) The bearing of claim 47, wherein the halogen-containing gas is selected from the group consisting of fluorine, chlorine, bromine, iodine, hydrogen chloride, and mixtures thereof.

50. (New) The bearing of claim 47, wherein the gaseous etchant gas comprises a mixture of a hydrogen gas and halogen-containing gas in a molar ratio of hydrogen gas to halogen-containing gas in the range of at least 0.75 mole of hydrogen per 2 moles of halogen.

51. (New) The bearing of claim 49, wherein the halogen-containing gas is chlorine in a concentration of about 0.1% to about 10% by volume of the gaseous etchant.